

Chapter 9 Plate Tectonics

Section 9.1 Continental Drift

(pages 248–253)

Reading Strategy (page 248)

Summarizing Fill in the table as you read to summarize the evidence of continental drift. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook.




Hypothesis	Evidence
Continental Drift	a. continental puzzle
	b.
	c.
	d.

The Continental Puzzle (page 248)

1. Wegener called Earth's ancient supercontinent _____.

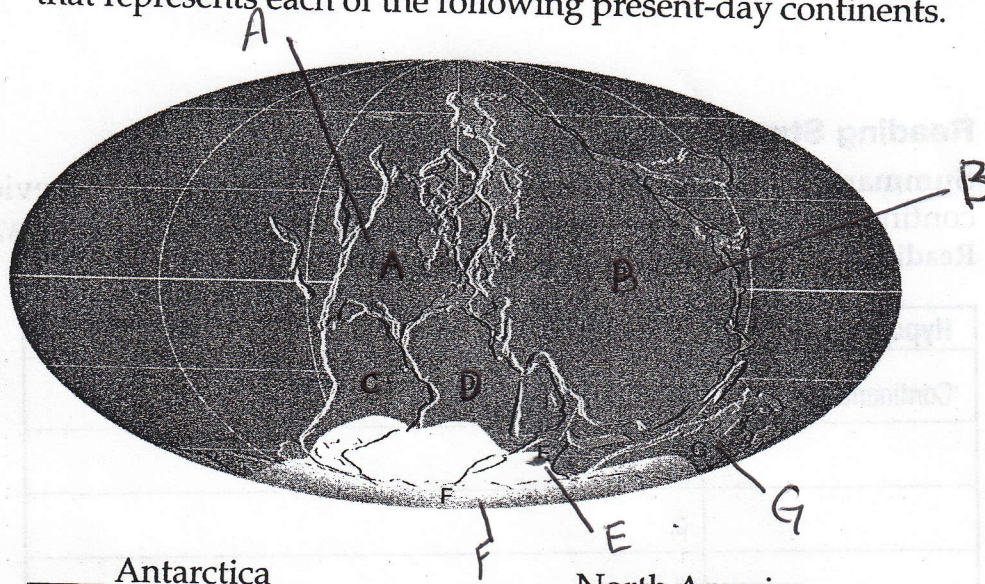
Evidence for Continental Drift (pages 249–251)

Match each example of continental drift with the type of evidence it is.

- | Example | Evidence for Continental Drift |
|--|--------------------------------|
| _____ 2.  Similar mountain chains run through eastern North America and the British Isles. | a. rock types and structures |
| _____ 3. Land areas that show evidence of ancient glaciation are now located near the equator. | b. matching fossils |
| _____ 4. The Atlantic coastlines of South America and Africa fit together. | c. continental puzzle |
| _____ 5.  Remains of Mesosaurus are limited to eastern South America and southern Africa. | d. ancient climates |
| 6.  _____ evidence for continental drift includes several fossil organisms found on different landmasses. | |
| 7. Is the following sentence true or false? If the continents were once part of Pangaea, rocks found on one continent should closely match those on the adjacent parts of another continent. _____ | |

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8. The figure shows Earth's ancient supercontinent as it appeared about 300 million years ago, according to Alfred Wegener. Write the letter that represents each of the following present-day continents.



- | | |
|-----------------------|---------------------|
| _____ Antarctica | _____ North America |
| _____ Europe and Asia | _____ Africa |
| _____ South America | _____ Australia |
| _____ India | |

Rejection of Wegener's Hypothesis (page 252)

9. Circle the letter of an example of one objection that critics had about Wegener's continental drift hypothesis.
- Wegener could not provide any evidence to support continental drift.
 - Wegener's idea of the mechanism capable of moving the continents was physically impossible.
 - Wegener's fossil evidence was not accurate.
10. Is the following sentence true or false? Wegener proposed that during continental drift, larger continents broke through the oceanic crust.
- _____
11. By 1968, data collected about the ocean floor, earthquake activity, and the magnetic field led to a new theory called _____.

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Section 9.2 Sea-Floor Spreading

This section discusses sea-floor spreading and subduction zones, and evidence for sea-floor spreading.

Reading Strategy

Identifying Supporting Evidence Copy the graphic organizer. After you read, complete it to show the types of evidence that supported the hypothesis of sea-floor spreading. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Evidence	Hypothesis
a. _____	
b. _____	
c. _____	

Exploring the Ocean Floor

Match each definition with its term.

Definition	Term
_____ 1. system that uses sound waves to calculate the distance to an object	a. sonar
_____ 2. deep faulted structure found along a divergent boundary	b. rift valley
_____ 3. elevated seafloor along a divergent boundary	c. oceanic ridge

The Process of Sea-Floor Spreading

4. Circle the letter of the description of a subduction zone.
- where an oceanic plate is forced beneath a second plate
 - where an oceanic plate grinds past a second plate
 - where a continental plate grinds past a second plate
 - where an oceanic plate moves away from a second plate

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Evidence for Sea-Floor Spreading

5. _____ has occurred when rocks formed millions of years ago show the location of the magnetic poles at the time of their formation.
6. Is the following sentence true or false? When magnetic mineral grains in a rock form, they become magnetized in the direction parallel to Earth's existing magnetic field. _____
7. ☐ Circle the letter of the statement representing some of the strongest evidence of sea-floor spreading.
 - a. Similar fossils are found in North America and Europe.
 - b. Earth's magnetic field periodically reverses polarity.
 - c. Strips of alternating polarity lie as mirror images across the ocean ridges.
 - d. Evidence of glaciation occurs on land in tropical and subtropical regions.
8. Circle the letter of the definition of reverse polarity.
 - a. the loss of magnetism by iron-rich mineral grains when heated
 - b. the gain of magnetism by iron-rich mineral grains when cooled
 - c. what rocks that show the same magnetism as the present magnetic field have
 - d. what rocks that show the opposite magnetism as the present magnetic field have
9. Is the following sentence true or false? Deep-focus earthquakes occur away from ocean trenches within the slab of lithosphere descending into the mantle. _____
10. Where do shallow-focus earthquakes occur relative to ocean trenches? _____
11. ☐ Circle the letter of the location of the oldest oceanic crust, according to ocean drilling data.
 - a. near the edges of continents
 - b. at the ridge crest
 - c. between the continental margins and ridge crest
 - d. deep in the asthenosphere
12. ☐ Circle the letter of the location of the youngest oceanic crust, according to ocean drilling data.
 - a. at the continental margins
 - b. at the ridge crest
 - c. between the continental margins and ridge crest
 - d. deep in the asthenosphere

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Section 9.3 Theory of Plate Tectonics

This section discusses plate tectonics, including lithospheric plates and types of plate boundaries.

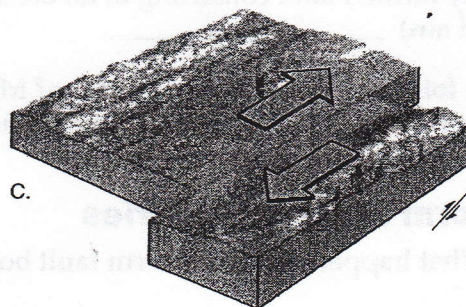
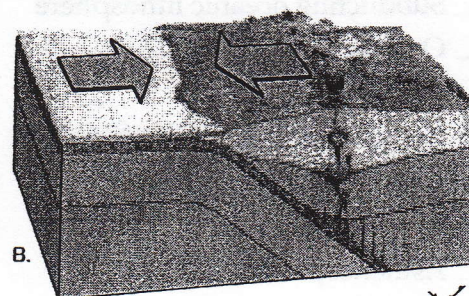
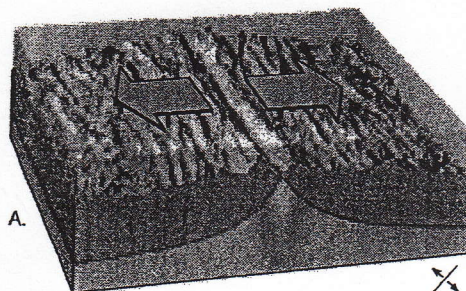
Reading Strategy

Comparing and Contrasting After you read, compare the three types of plate boundaries by completing the table. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Boundary Type	Relative Plate Motion
convergent	a.
divergent	b.
transform fault	c.

Earth's Moving Plates

- Is the following sentence true or false? The lithospheric plates move at about 5 km per year. _____
- Identify each type of plate boundary shown in the figure.



- A. _____
 B. _____
 C. _____

3. Circle the letter of the type of plate boundary that occurs when two plates move together.

- divergent
- spreading center
- convergent
- transform fault

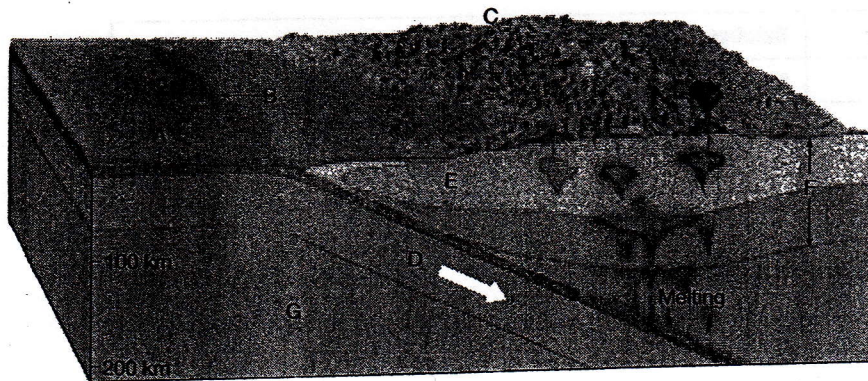
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Divergent Boundaries

4. Is the following sentence true or false? Oceanic lithosphere is created at divergent boundaries. _____
5. Is the following sentence true or false? Divergent boundaries only occur on the ocean floor. _____

Convergent Boundaries

6. Select the appropriate letter in the figure that identifies each of the following features.



- _____ Subducting oceanic lithosphere
- _____ Oceanic crust
- _____ Trench
- _____ Continental volcanic arc
- _____ Continental lithosphere
- _____ Continental crust
- _____ Asthenosphere

7. Newly formed land consisting of an arc-shaped island chain is called a(n) _____.
8. Is the following sentence true or false? Mountains form as a result of a collision between two continental plates.

Transform Fault Boundaries

9. What happens at a transform fault boundary? _____

10. Circle the letter of the example of a transform fault boundary that is NOT located in an ocean basin.

a. the San Andreas Fault	b. the Aleutian Trench
c. the Himalayan mountains	d. the Nazca plate